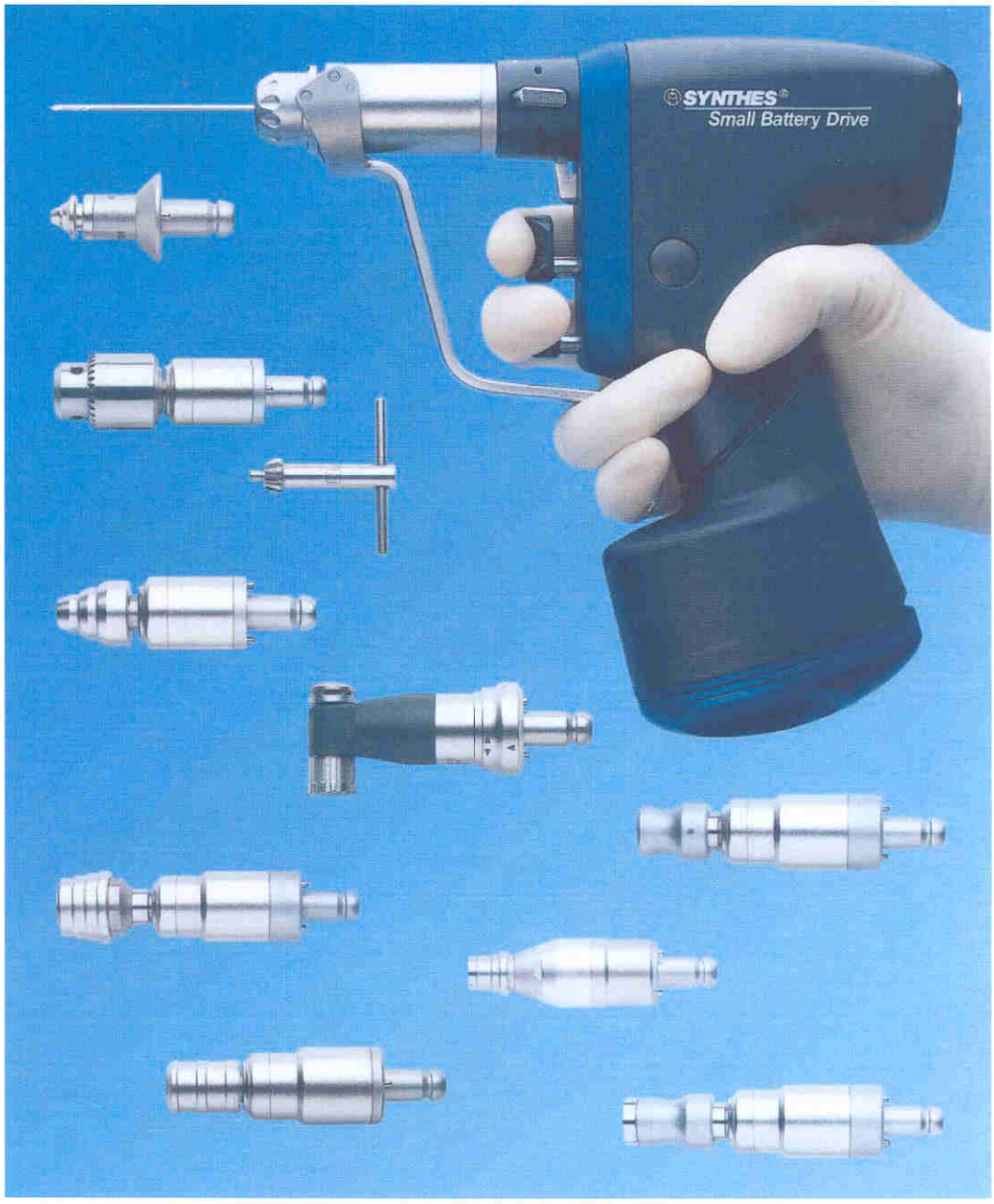
Small Battery Drive. For orthopaedic trauma applications.

User's Manual



SYNTHES® Instruments and implants approved by the AO Foundation

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Small Battery Drive (532.010)

- Variable speed: 0–3840 rpm
  (max. speed varies by attachment)
- Maximum torque: 0–6.0 Nm
  (max. torque varies by attachment)
- Weight, including 12 V battery: 810 grams,
  including 14.4 V battery: 916 grams
- Cannulation: 3.2 mm

Attachment release button
Allows easy exchange
of attachments

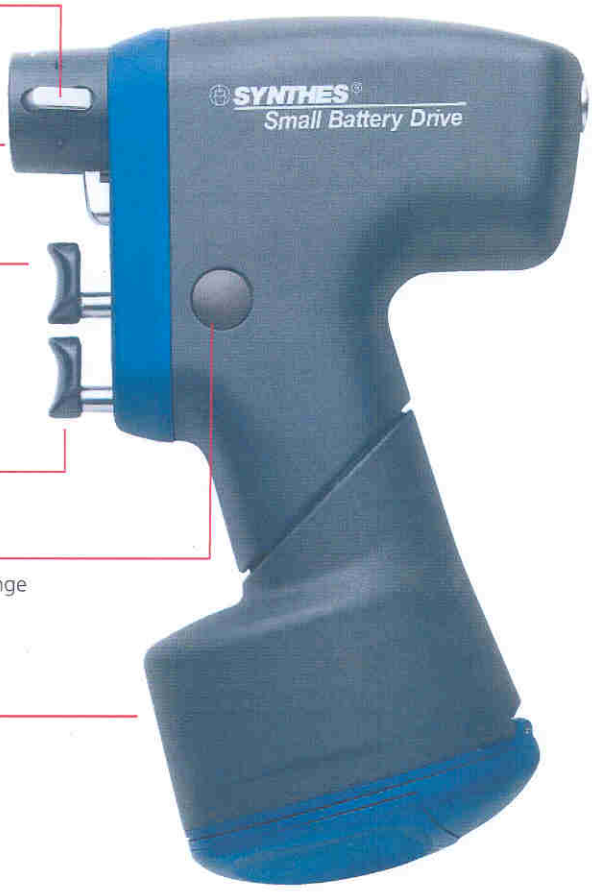
Attachment coupling
Accepts a wide variety
of attachments

Instant-reverse or oscillation trigger
Reverses rotation to
counterclockwise
direction or activates
oscillation mode

Variable-speed trigger
Controls rotational speed

Release buttons for battery casing
Allow easy intraoperative battery exchange

Battery casing
Holds battery in sterile
environment



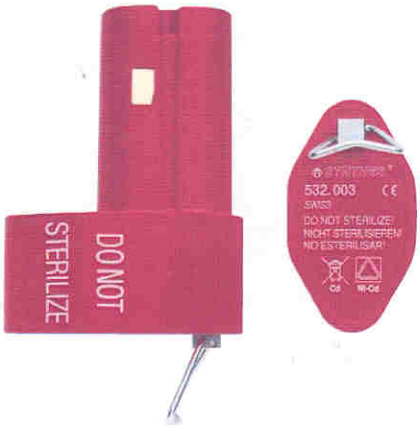
Mode switch turns
drive off for safe
attachment exchange
and selects "on" or
"oscillation" mode

This device complies with the following standards:
UL 2601-1
EN 60601 (IEC 601-1)
EN 60601-1-1 (VDE 0750 part 1 and 2)
EN 55011 (VDE 0875 part 11)
Limiting values of class B, group 1

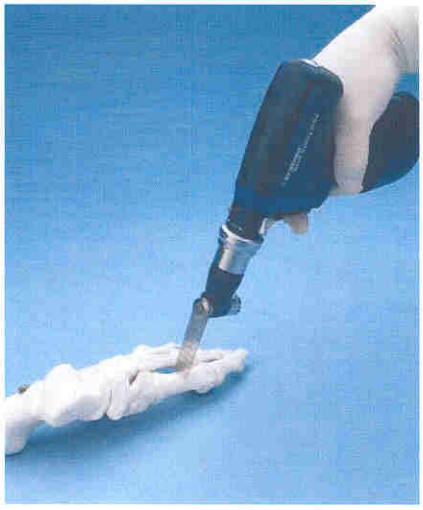
12 V Battery (532.003)

- Voltage: 12 VDC
- Capacity: 0.5 Amp hours
- Type: NiCd
- Working temperature: 0°C to 50°C (32°F to 122°F)
- Charging Time: 30 minutes maximum
- Discharge protection: prevents total battery discharge, significantly decreases memory effect, maintains battery capacity, and increases battery life
- Indications include drilling, sawing, and inserting K-wires

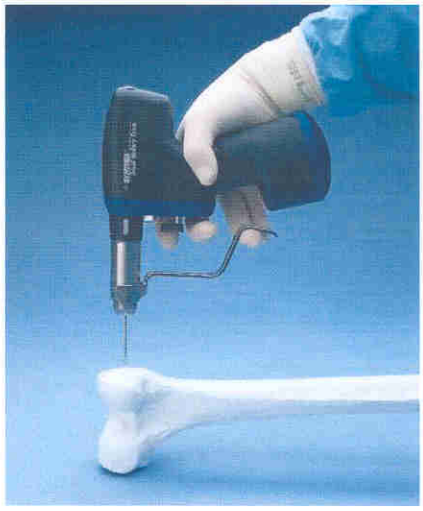
Important: Do not sterilize batteries! Batteries will no longer function.



Drilling



Sawing



K-wire insertion

14.4 V Battery (532.033)

- Voltage: 14.4 VDC
- Capacity: 0.5 Amp hours
- Type: NiCd
- Working temperature: 0°C to 50°C (32°F to 122°F)
- Charging Time: 40 minutes maximum
- Discharge protection: prevents total battery discharge, significantly decreases memory effect, maintains battery capacity, and increases battery life
- Indications include DHS, DCS, and intramedullary reaming

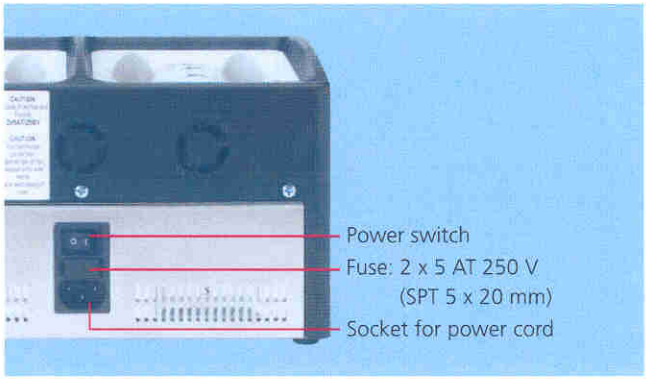
Important: Do not sterilize batteries! Batteries will no longer function.

Reaming

Universal Battery Charger (530.601)

- Four charging bays accept Small Battery Drive, Power Drive and Battery Power Line batteries
- One (1) battery can be placed in each charging bay allowing a maximum of four (4) batteries to be charged at the same time

6515-01-498-3999 Fiber Optic Headlight System Owner's Manual Fiber Optic Headlight Operating Manual Light Source, Model Ref 49500, 49502, 49504 and 49506 Product Brochure Headlight System, Model



Complies with standards:
UL 60950
IEC 60950
EN 55022 class B
EN 61000-3-2, 3
EN 61000-4-2, 3, 4, 5, 6, 11

Attachments for Small Battery Drive

Drilling speed attachments

532.011 Mini Quick Coupling
532.012 Stryker J-Latch Coupling

With 12 V battery:
Maximum speed: 3200 rpm
Maximum torque: 0.5 Nm

With 14.4 V battery:
Maximum speed: 3840 rpm
Maximum torque: 0.6 Nm

Accepts mini quick coupling or Stryker J-latch drill bits.

532.022 Quick Coupling for K-Wires
Cannulation: 3.2 mm (fully open)

With 12 V battery:
Maximum speed: 800 rpm
Maximum torque: 3.0 Nm

With 14.4 V battery:
Maximum speed: 900 rpm
Maximum torque: 2.3 Nm

To insert/remove Kirschner wires and guide pins 0.6 mm–3.2 mm in diameter (any length)

The following drilling speed attachments are geared for a maximum drive speed of 1200 rpm with the 12 V battery and 1440 rpm with the 14.4 V battery. The maximum torque is 1.3 Nm with the 12 V battery and 1.6 Nm with the 14.4 V battery.*

05.001.250 Quick Coupling for drill bits
Cannulation: 2.1 mm
Accepts cutting tools and instruments with the AO quick coupling fitting.

05.001.252 Small Chuck with Key
Cannulation: 3.3 mm
Accepts round and triangular shafts: up to 4.5 mm

* Performance specifications on file at Synthes.

05.001.253 Large Chuck with Key
Cannulation: 3.3 mm
Accepts round and triangular shafts: up to 6.5 mm

Saw attachments

532.021 Sagittal Saw Attachment
Maximum speed: 14,000 oscillations per minute

532.023 Oscillating Saw Attachment II
Maximum speed: 13,000 oscillations per minute

Reaming speed attachments

The following reaming speed attachments are geared for a maximum speed of 384 rpm and a maximum torque of 6.0 Nm with the 14.4 V battery.* All reduction drive units allow intramedullary reaming with most IM nail systems.

Note: The reaming speed attachments should only be used with the 14.4 V battery for optimal performance.

05.001.251 AO Screw Attachment
Cannulation: 2.0 mm
Accepts AO coupling screwdriver

05.001.254 Chuck with Key
Cannulation: 3.2 mm
Accepts round and triangular shafts: up to 6.5 mm

* Performance specification on file at Synthes.

Reaming speed attachments continued

532.015 Large Quick Coupling
Cannulation: 3.2 mm
Accepts DHS and DCS triple reamers, screwdriver shafts and cannulated drill bits with large quick coupling fitting

532.017 AO Reduction Drive Unit
Cannulation: 3.2 mm
Accepts cutting tools and instruments with AO reaming fitting

532.018 Hudson Reduction Drive Unit
Cannulation: 3.2 mm
Accepts cutting tools and instruments with Hudson fitting

532.019 Trinkle Reduction Drive Unit
Cannulation: 3.2 mm
Accepts cutting tools and instruments with Trinkle fitting

532.020 Modified Trinkle Reduction Drive Unit
Cannulation: 3.2 mm
Accepts cutting tools and instruments with modified Trinkle fitting

Connect the charger to the electrical cord, and plug the cord into a 110/120 VAC outlet.

Turn on the charger by pressing the power switch to ON. All LEDs on the status indicator panels will illuminate (red, yellow and green), when the charger is empty and ready to charge. (Figure 1)

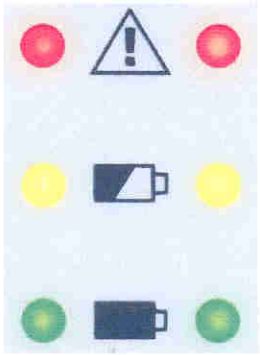


Figure 1

Insert the battery into one of the appropriate charging bays. Only the yellow LED should remain illuminated, indicating that the battery is charging. (Figure 2)

When the green LED illuminates, the battery is fully charged and operational. (Figure 3) The battery should be left in the charging bay until needed.

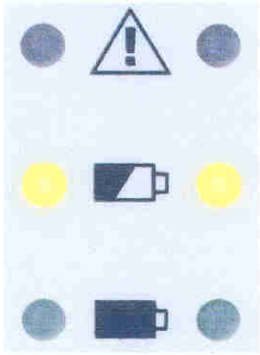


Figure 2

The battery can be removed during the charging process; however, the battery may not be fully charged and operational duration may be shorter.

Important:
Always leave the charger switched on when a battery is inserted in a charging bay. Leaving a battery in the charger when it is switched off or unplugged may permanently discharge the battery.

Never attempt to insert more than one battery in the same charging bay.

Note: If LEDs do not follow this sequence, refer to the troubleshooting section, page 32.

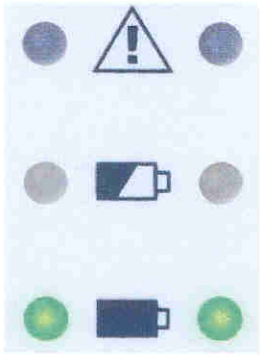


Figure 3

Operating Instructions — Battery Pack

The battery pack assembly requires a scrubbed person and a circulating person to insert the battery and preserve the sterile field.

Scrubbed person

1 Hold the sterilized battery casing and open the lid.

2 Place the sterilized battery insertion shield on the battery casing.

Circulating person

3 Carefully insert the non-sterile battery into the sterile battery casing.

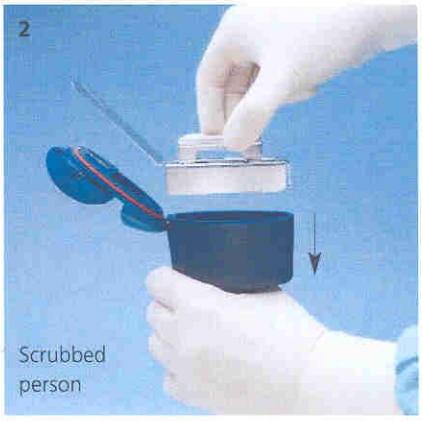
4 Press firmly until it engages.

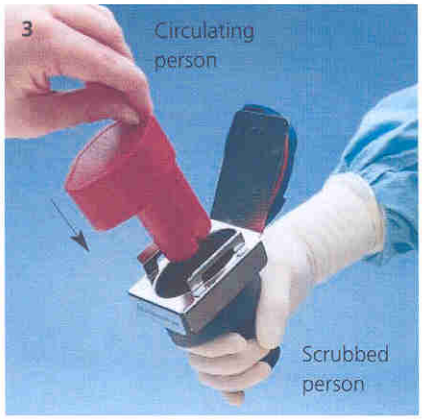
5 Remove the battery insertion shield.

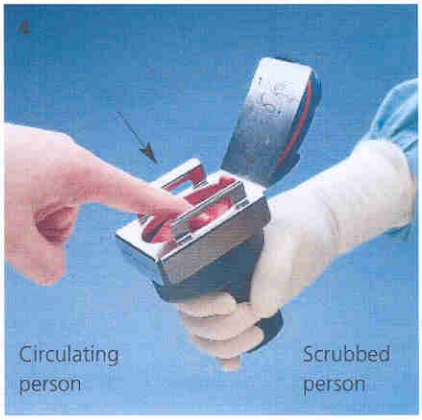
Scrubbed person

6 Close and lock the lid.

Important: To prevent injuries, the mode switch should always be in the "OFF" position when inserting or removing instruments.







Operating Instructions — Drive Unit

Speed control

For forward/reverse operation, position the mode switch to "ON." For forward (clockwise) rotation, press the variable-speed trigger of the drive unit. For reverse (counterclockwise) rotation, press both triggers.

For forward/oscillate operation, position the mode switch to "OSC." For forward rotation, press the variable-speed trigger of the drive unit. For oscillating, press both triggers.

Important: Mode switch must be in the "ON" or "OSC" position to operate drive.

Operating Instructions — Attachments

Important: To prevent injuries, the mode switch should always be in the "OFF" position when inserting or removing instruments.

Install attachment

Insert the attachment into the attachment coupling. It is not necessary to press the release buttons for installation. Check the correct engagement of the attachment by pulling it slightly.

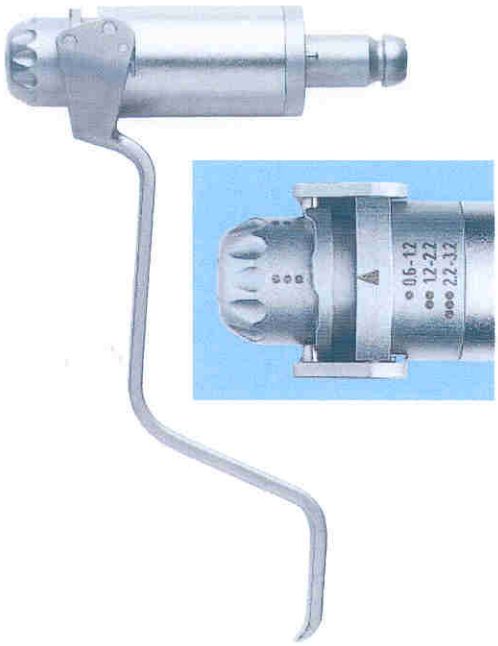
Remove attachment

Simultaneously press the attachment release buttons and remove the attachment from the coupling.

Quick Coupling for K-wires (532.022)

– For insertion of Kirschner wires from 0.6 mm to 3.2 mm diameter (see page 12 for installation and removal of attachments).

Important: To prevent injuries, the mode switch should always be in the "OFF" position when inserting or removing instruments.



Insert K-wire into quick coupling for K-wires

Select and set the adjustment range for the diameter of the K-wire according to the inscription.

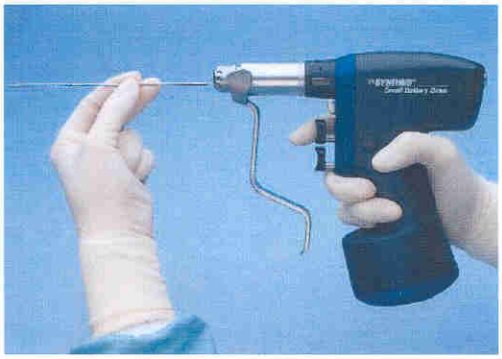
• = 0.6 mm–1.2 mm
•• = 1.2 mm–2.2 mm
••• = 2.2 mm–3.2 mm

Insert the K-wire from the front opening to the desired working depth.

Note: The K-wire is "presqueezed" upon insertion into the coupling to prevent slippage during handling. Pulling back on the lever grasps the K-wire securely for insertion intobone.

Insert K-wire into bone

Grasp the K-wire by pulling the lever toward the handpiece, and press the lower (forward) trigger.



Remove K-wire from bone

Slide the drive unit and coupling over the K-wire. Grasp the wire by squeezing the lever toward the handpiece, and press both triggers (reverse) simultaneously to remove the wire from the bone.

Note: The mode switch must be in the "ON" position to enable reverse.

Operating Instructions — Attachments for use with 12 V and 14.4 V Batteries continued

Mini Quick Coupling (532.011)

Stryker J-Latch Coupling (532.012)
– Accept mini quick coupling or Stryker J-latch drill bits

To insert an instrument into the mini quick coupling or Stryker J-latch coupling, retract the collar of the coupling and insert the instrument shaft completely with a slight rotation to align the keyway. When the shaft is fully inserted, release the collar. Pull on the instrument slightly to ensure that it is held securely.

Quick Coupling for drill bits (05.001.250)
– Accepts quick coupling drill bits
– Allows use of Radiolucent Drive (511.30) with Adaptor (532.031)

See page 12 for installation and removal of attachments.

Important: To prevent injuries, the mode switch should always be in the "OFF" position when inserting or removing instruments.

Insert an instrument into the quick coupling
Insert the instrument shaft completely with a slight rotation to align the keyway. Pull on the instrument slightly to ensure that it is held securely.

Note: Collar does not need to be retracted to insert instrument.

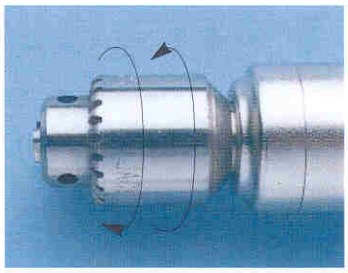
Remove the instrument
Retract the collar of the quick coupling to release the instrument.

Large Chuck with key (05.001.253)
- Accepts round shafts from 1.0 mm to 6.0 mm in diameter, or triangular shafts up to 6.5 mm

Small Chuck with key (05.001.252)
- Accepts round shafts from 0.5 mm to 4.0 mm in diameter, or triangular shafts up to 4.5 mm

See page 12 for installation and removal of attachments.

Important: To prevent injuries, the mode switch should always be in the "OFF" position when inserting or removing instruments. Always remove the key from the chuck before operating drive unit.



Insert an instrument
Open the chuck jaws by turning the key counterclockwise, or by manually turning the collar. Insert the instrument shaft into the opened chuck.

Close the chuck manually by rotating the collar, keeping the shaft centered in the jaws. Tighten the chuck by turning the key clockwise.

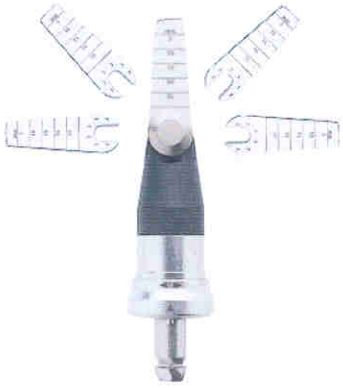
Remove an instrument
Turn the key counterclockwise to open the jaws. Remove the instrument.

Operating Instructions — Attachments for use with 12 V and 14.4 V Batteries continued

Sagittal Saw Attachment (532.021)
– Accepts small saw blades

Important: To prevent injuries, the mode switch should always be in the "OFF" position when inserting or removing instruments. The saw blade should always be handled near the hub.

Note: To minimize heat generation and provide optimal sawing results, always use new Synthes saw blades. Used blades cannot be resharpened.



Position the saw attachment

Once mounted, the saw attachment can be locked in eight different positions in 45° increments (Figure 1). To reposition the saw attachment, push the adjustment sleeve and turn the attachment to the desired position (Figure 2).

Figure 1

Figure 2

Insert saw blade

Open the blade coupling by pulling the locking knob and turning it counterclockwise. Insert the new saw blade and adjust it to the desired position (Figure 3). The blade position can be locked in 45° increments. Squeeze the blade coupling closed and turn the locking knob clockwise to tighten (Figure 4).

Remove saw blade

Open the blade coupling. Remove the blade.

Important: Mode switch should always be in the "ON" position while using the oscillating saw attachment.

Figure 3

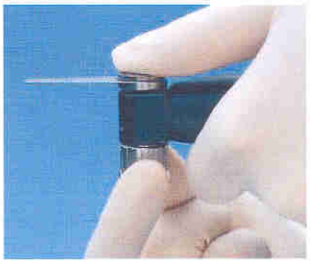


Figure 4

Oscillating Saw Attachment II (532.023)

- Accepts crescentic saw blades and intra-oral saw blades (shown on page 38).

Important: To prevent injuries, the mode switch should always be in the "OFF" position when inserting or removing instruments. The saw blade should always be handled near the hub.

Synthes recommends using a new saw blade for each surgery, as used saw blades may increase the risk of necrosis and increase the cutting time. All oscillating and intra-oral saw blades are sold sterile.

Insert saw blade

Pull back the collar of the attachment.

Insert a saw blade into the saw blade coupling and move it into the desired position.

Release the collar. Pull lightly on the saw blade to confirm that it is secure.

Remove saw blade

Pull back on the collar of the attachment, and remove the saw blade.

Operating Instructions — Attachments for use with 12 V and 14.4 V Batteries continued

Adaptor for Radiolucent Drive (532.031)
- Allows use of Radiolucent Drive (511.30) with small battery drive

Important: To prevent injuries, the mode switch should always be in the "OFF" position when inserting or removing instruments.

Insert adaptor
- Insert the Quick Coupling for drill bits (05.001.250) into the small battery drive
- Insert the Adaptor (532.031) into the quick coupling
- Slide the Radiolucent Drive (511.30) over the adaptor and the quick coupling and rotate until the radiolucent drive engages in the adaptor

Remove adaptor
Pull the radiolucent drive off the small battery drive and its attachments. Remove the adaptor from the quick coupling.

See page 12 for installation and removal of attachments.

Small battery drive with quick coupling for drill bits and adaptor for radiolucent drive

Small battery drive and radiolucent drive assembled

Radiolucent Drive (511.30)

Adaptor (532.031)

Quick Coupling for drill bits (05.001.250)

Large Quick Coupling (532.015)

- Accepts DHS and DCS triple reamers, large quick coupling screwdriver shafts, and large quick coupling cannulated drill bits

See page 12 for installation and removal of attachments.

Insert an instrument into large quick coupling

Push the collar toward the instrument (away from the drive unit) and insert the instrument shaft completely with a slight rotation to align the keyway. When the shaft is fully inserted, release the collar. Pull on the instrument slightly to ensure that it is held securely.

Remove an instrument

Push the collar of the large quick coupling to release the instrument.

Reduction drive units
– Allow intramedullary reaming with most IM nailing systems

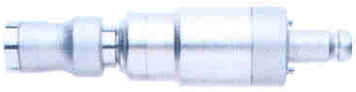
See page 12 for installation and removal of attachments.

AO Reduction Drive Unit (532.017)

Hudson Reduction Drive Unit (532.018)

Trinkle Reduction Drive Unit (532.019)

Modified Trinkle Reduction Drive Unit (532.020)



Insert an instrument into reduction drive unit
Insert the instrument shaft into the opening until it engages.

Remove an instrument
Retract the collar of the reduction drive unit to release the instrument.

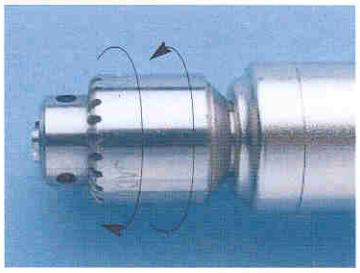
Important: Always use a 14.4 V Battery (532.033) and Drive Casing (532.032) when reaming.

Chuck with Key, Reaming Speed (05.001.254)
– Accepts round shafts up to 6.0 mm and triangular shafts up to 6.5 mm.

See page 12 for installation and removal of attachments.

Insert an instrument
Open the chuck jaws by turning the key counterclockwise, or by manually turning the collar. Insert the instrument shaft into the opened chuck.

Close the chuck manually by rotating the collar, keeping the shaft centered in the jaws. Tighten the chuck by turning the key clockwise.



Remove an instrument
Turn the key counterclockwise to open the jaws. Remove the instrument.

AO Screw Attachment (05.001.251)

See page 12 for installation and removal of attachments.

Insert an instrument
Insert the instrument shaft completely with a slight rotation to align the keyway. Pull on the instrument slightly to ensure that it is held securely.

Note: Collar does not need to be retracted to insert instrument.

Remove the instrument
Retract the collar of the quick coupling to release the instrument.

Operating Instructions—Adaptor for Small Battery Drive

Insert adaptor into small battery drive

Instruments	
05.001.000	Standard Console with Irrigation
05.001.024	Adaptor, for Small Battery Drive
532.010	Small Battery Drive

The small battery drive adaptor allows the user to power the small battery drive handpiece with the Electric Pen Drive console.

Insert the adaptor into the handpiece, confirming the contacts on the adaptor align with the contacts in the recess of the handpiece. Press firmly to ensure the adaptor is engaged correctly, and check by pulling lightly downward on the adaptor. For safety, the adaptor can be inserted fully only when in the correct orientation.

Remove small battery drive adaptor
Press both release buttons simultaneously on the handpiece to remove the adaptor.

Operating Instructions—Adaptor for Small Battery Drive

Connect small battery drive adaptor to console
To connect the adaptor cable to the console, align the red dot on the plug with the red dot on the connector for the small battery drive ( ) and push the plug into the connector. Do not force the plug into the connector as this may damage the plug and/or the console.

To remove the cable, retract the release sleeve on the plug and pull back.

Operating Instructions—Graphic Case

Modular Graphic Case
The graphic case provides organized storage and serves as a sterilization container for the system.

The attachment rack provides organized storage and serves as a sterilization container for the attachments. It also serves as an organized rack for the attachments in the sterile field.

Grommets (690.576.04) provided with the attachment rack are designed to help OR personnel organize the attachments in the rack by plugging the holes for attachments they did not purchase. The grommets are autoclavable, allowing them to be left in the attachment rack for cleaning and sterilization.

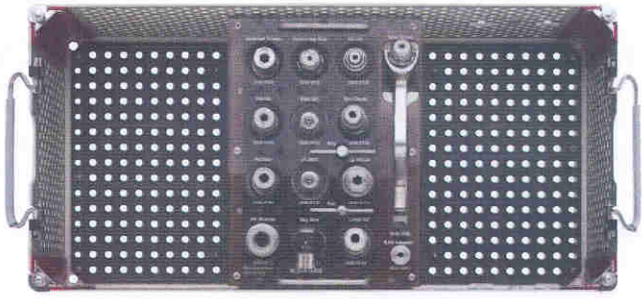
The Small Battery Drive graphic case is available with insert tray options that can be ordered for various set configurations.

The standard graphic case configuration includes base, lid, attachment rack and three insert trays. Customers can choose up to 2 insert trays from option 1 and 1 insert tray from option 2 to configure the case to meet their individual needs.

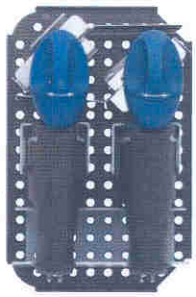
60.550.010	Base Assembly for Small Battery Drive Graphic Case
60.550.011	Lid for Small Battery Drive Graphic Case
60.550.012	Attachment Rack for Small Battery Drive Graphic Case

Choose up to 2 trays from Option 1

60.550.013	Insert Tray for 12 V Battery Casings
60.550.014	Insert Tray for 14.4 V Battery Casings
60.550.015	Insert Tray for Small Battery Drive Adaptor for Electric Pen Drive


60.555.010, 60.555.011 and 60.555.012

60.550.013

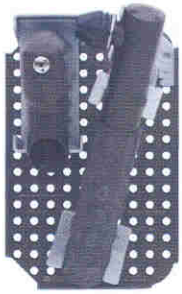

60.550.014

60.550.015

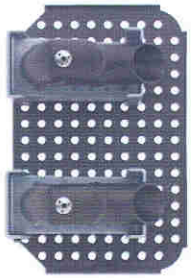
Choose 1 tray from Option 2

60.550.016 Insert Tray for Small Battery Drive Handpiece and Radiolucent Drive

60.550.017 Insert Tray for Two Small Battery Drive Handpieces



60.550.016



60.550.017

Graphic Case Set for Small Battery Drive (01.001.501)

The most common Small Battery Drive graphic case configuration includes the following trays:

60.550.010 Base Assembly for Small Battery Drive Graphic Case

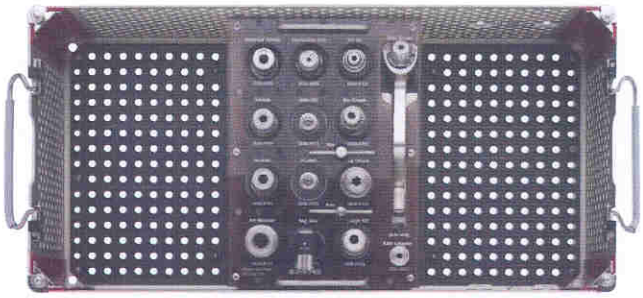
60.550.011 Lid for Small Battery Drive Graphic Case

60.550.012 Attachment Rack for Small Battery Drive Graphic Case

60.550.013 Insert Tray for 12 V Battery Casings

60.550.014 Insert Tray for 14.4 V Battery Casings

60.550.016 Insert Tray for Small Battery Drive Handpiece and Radiolucent Drive



60.550.010, 60.550.011 and 60.550.012

Also Available

690.576.04 Grommets for Attachment Rack for Small Battery Drive Graphic Case, 4-Pack

Small Graphic Case

The small graphic case houses a basic set with only a few attachments.

690.525 Small Graphic Case for Small Battery Drive Set

Care and Maintenance

Regular care and maintenance according to the following guidelines can significantly increase the reliability and life span of the system. Synthes recommends annual preventive services. Yearly maintenance will ensure that the equipment maintains the highest standard of performance and will prolong the life of the system.

Important: Disassemble battery pack and return batteries to charger immediately after each use. **Do not disinfect, immerse, or sterilize batteries.** Batteries may be wiped with a cloth.

- Before cleaning and sterilization, remove attachments, instruments and cutting tools from the drive units
- Cleaning and lubrication should be performed immediately after each use
- Clean the drive units, attachments and battery casings by hand. **Never immerse or clean in an automatic washer or ultrasonic cleaner**
- Use a mild, neutral pH cleaning solution

Caution: Do not sterilize batteries! Batteries will no longer function.

Cleaning battery drive

Important: Disassemble battery pack and return batteries to battery charger immediately after each use. Do not disinfect, immerse, or sterilize batteries. Batteries may be wiped occasionally with a soft cloth.

Before cleaning, manipulate all moving parts under running water to loosen and remove debris. Open and close chucks, and move quick couplings back and forth.

1
Remove blood and debris

Manually remove blood and debris from the drive and attachments under running water. Use a mild cleaning solution and a soft brush or cloth. **Do not allow water to enter the drive unit.**

2
Disinfect

Wipe or spray the drive unit, battery casing, and attachments with disinfectant.

3
Rinse

Remove all residues from the disinfected drive unit, battery casing, and attachments under running water using a soft brush or cloth.

4

Clean cannulations

Instrument	
519.40	Cleaning Brush

Clean cannulations of the drive unit and attachments with the cleaning brush.

Important: The quick coupling for K-wires must be fully open to the largest diameter setting before inserting the brush.

5

Dry all components

Dry the drive unit and attachments with a soft cloth.

Important: Do not use solvents to disinfect the batteries. Battery poles must not contact water or solvents: Danger of short circuiting!

Care and Maintenance continued

Lubricating

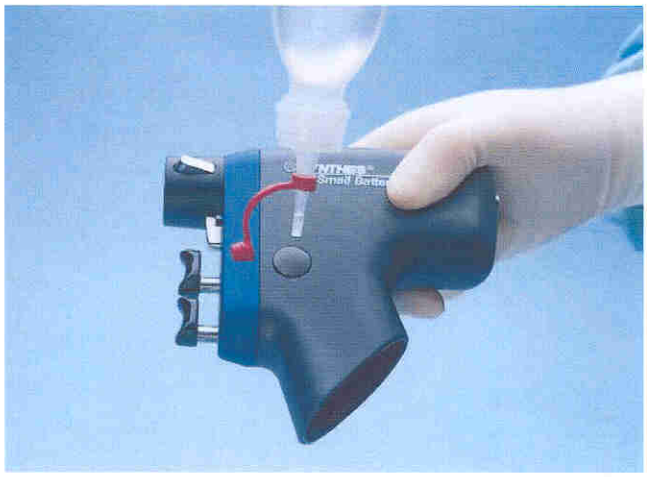
519.97 Synthes Autoclavable Oil

Use only Synthes autoclavable oil to lubricate the small battery drive and attachments. Lubricate the attachments after every cleaning and before sterilization. The drive unit should only be oiled if resistance is noted in the triggers, attachment coupling site, or release buttons for the battery casing.

Important: NEVER lubricate the radiolucent drive.

Lubricate all moving parts of the attachments and battery casings with one to two drops of oil. Operate the parts to distribute the oil, and wipe off the excess oil.

Periodically, apply one drop of Synthes autoclavable oil onto each trigger shaft and move it a few times. Also lubricate the attachment coupling site and the release buttons for the attachments.



Cleaning battery and battery charger

To clean battery, wipe with a soft cloth.

Important: Do not use solvents to disinfect the batteries. Battery poles must not contact water or solvents: Danger of short circuiting!

Battery storage and charging

After cleaning, insert the batteries into the charger. The charger continuously monitors the battery level and automatically recharges as necessary. This ensures that the batteries are fully charged and ready for use at any time. When batteries occupy all charger bays, extra batteries can be stored in a cool dry place. Before the next use, the batteries must be charged.

Important:
After prolonged storage of the batteries outside the charger, two or three charging cycles may be necessary to achieve full battery capacity.

Always leave the charger switched on when a battery is inserted in a charging bay to ensure availability and prevent discharge.

Sterilization

All power equipment should be steam sterilized in accordance with the following guidelines:

- Disassemble all parts, including battery casing, attachments, and instruments
- The battery casing must be sterilized in the open position

Wrapped	Temperature	Minimum Exposure Time
Prevacuum	132°–135°C (270°–275°F)	4 minutes
Unwrapped (Flash)		
Prevacuum	132°–135°C (270°–275°F)	4 minutes

Times represent exposure times only and not total cycle times.

Important: Do not accelerate the cooling process. A thermal overload circuit prevents drive unit operation when the drive unit is overheated. After cooling to room temperature, the drive unit should function. Hot air and ethylene oxide gas (ETO) sterilization are not recommended.

Caution: Do not sterilize batteries! Batteries will no longer function!

Troubleshooting — Drive Unit and Attachments

Problem	Possible Causes	Remedy
Machine does not start.	Mode switch may be set to OFF.	Set mode switch to ON or OSC.
	No electrical contact between drive unit and battery casing.	Reattach or change battery casing.
	Battery is drained.	Charge or replace battery.
	Drive unit has not cooled after sterilization.	Allow drive unit to cool to room temperature.
Machine lacks power.	Battery is drained.	Charge or replace battery.
Machine suddenly stops.	Battery is drained.	Charge or replace battery.
	Drive unit has overheated.	Allow drive unit to cool to room temperature.
Machine continues to run after trigger is released.	Trigger is jammed by residue.	Immediately turn the mode switch to OFF. Operate trigger several times, clean, and oil according to instructions. (Use only Synthes autoclavable oil.)
Attachments cannot couple to drive unit.	Coupling is blocked by residue.	Remove solid particles with pickups. Oil according to instructions. (Turn mode switch to OFF.)
Difficulty removing attachments from drive unit.	Release inhibited by pulling on attachment while pressing release buttons.	Press release buttons before attempting to remove attachments.
Cannot attach instrument or difficulty attaching instruments.	Attachment or instrument excessively worn.	Replace attachment or instrument.
K-wire completely inserted into coupling, cannot be advanced.	K-wire inserted incorrectly into rear of machine.	Disconnect quick coupling, hold drive unit with opening down, and shake out K-wire. (Turn mode switch to OFF.)
Oscillating saw attachment vibrates excessively.	Saw blade coupling is loose.	Retighten locking knob of the saw blade coupling.
	Mode switch is set to OSC.	Turn mode switch to ON.
	14.4 V battery is being used.	Change to 12 V battery.

Troubleshooting — Batteries and Universal Battery Charger

Problem	Possible Causes	Remedy
Drive unit lacks power.	Battery is drained.	Charge or replace battery.
	Battery is not fully charged.	Charge or replace with a fully charged battery.
	Battery cannot be fully charged.	Replace battery.
Battery is physically damaged	Battery has been dropped from height.	Replace battery.
	Battery was autoclaved.	Replace battery.
Before inserting battery into charger, LEDs do not illuminate.	Battery charger is switched OFF.	Switch battery charger to ON.
	Electrical cord is not plugged in.	Plug in cord.
	Fuse is blown.	Call Synthes Service Department.
	Battery charger requires service.	Return charger to Synthes Service Department.
When battery is inserted into charger, red LED illuminates.	Battery is not correctly inserted.	Remove battery and insert again.
	Battery cannot be fully charged.	Replace battery.
After battery is inserted into charger, red LED flashes.	Battery type could not be identified.	Remove battery and insert again.
	Battery is warm.	Leave battery in charger. When the battery begins cooling, the yellow LED will illuminate and the red LED will flash. After the battery has cooled down, the red LED will stop flashing and the charging process will start automatically.
During the charging cycle, the red LED flashes and yellow LED illuminates.	Battery is warm.	Leave battery in charger. After the battery has cooled down, the red LED will stop flashing and the charging process will start automatically.

See page 9 for universal battery charger operating instructions.

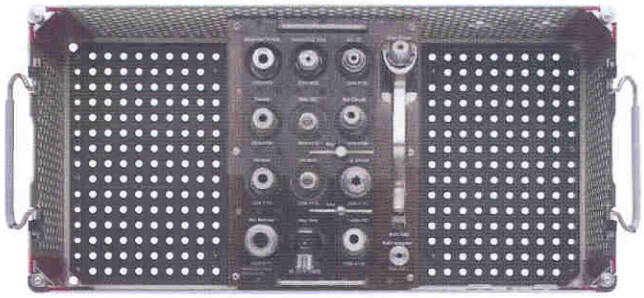
If the suggested solutions are unsuccessful, please contact the Synthes Service Department at (800) 288-6698.

Synthes recommends an annual preventive maintenance service by qualified Synthes personnel.

Small Battery Drive Set (105.955)

Graphic Case

60.550.010	Base Assembly for Small Battery Drive Graphic Case
60.550.011	Lid for Small Battery Drive Graphic Case
60.550.012	Attachment Rack for Small Battery Drive Graphic Case
60.550.013	Insert Tray for 12 V Battery Casings
60.550.016	Insert Tray for Small Battery Drive Handpiece and Radiolucent Drive

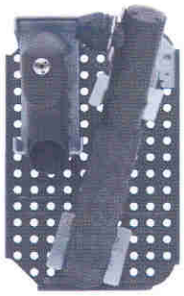


60.555.010, 60.555.011 and 60.555.012

Instruments

05.001.250	Quick Coupling for Drill Bits
05.001.253	Large Chuck with key
530.601	Universal Synthes Battery Charger, 4 bays
532.002	Battery Casing, for 12 V Battery, 2 ea.
532.003	Small Battery Drive 12 V Battery, 2 ea.
532.004	Battery Insertion Shield, 2 ea.
532.010	Small Battery Drive
532.011	Mini Quick Coupling
532.012	Stryker J-latch Coupling
532.015	Large Quick Coupling
532.021	Sagittal Saw Attachment
532.022	Quick Coupling for K-Wires

60.550.013

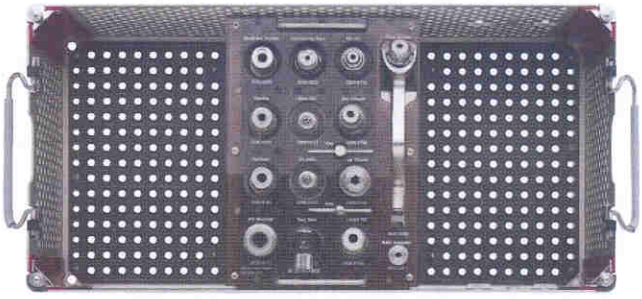


60.550.016

Small Battery Drive with 14.4 V Battery Pack Set (105.954)

Graphic Case

60.550.010	Base Assembly for Small Battery Drive Graphic Case
60.550.011	Lid for Small Battery Drive Graphic Case
60.550.012	Attachment Rack for Small Battery Drive Graphic Case
60.550.013	Insert Tray for 12 V Battery Casings
60.550.014	Insert Tray for 14.4 V Battery Casings
60.550.016	Insert Tray for Small Battery Drive Handpiece and Radiolucent Drive

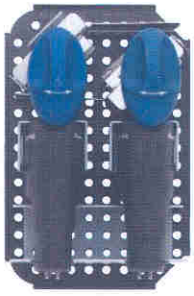


60.555.010, 60.555.011 and 60.555.012

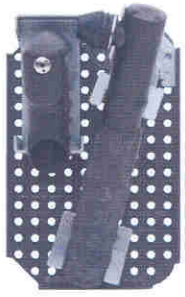
Instruments

05.001.250	Quick Coupling for Drill Bits
05.001.253	Large Chuck with Key
530.601	Universal Synthes Battery Charger, 4 bays
532.002	Battery Casing, for 12 V Battery, 2 ea.
532.003	Small Battery Drive 12 V Battery, 2 ea.
532.004	Battery Insertion Shield, 2 ea.
532.010	Small Battery Drive
532.011	Mini Quick Coupling
532.012	Stryker J-latch Coupling
532.015	Large Quick Coupling
532.017	AO Reduction Drive
532.021	Sagittal Saw Attachment
532.022	Quick Coupling for K-Wires
532.031	Adaptor for Radiolucent Drive
532.032	Battery Drive, for 14.4 V Battery, 2 ea.
532.033	Small Battery Drive 14.4 V Battery, 2 ea.

60.550.013



60.550.014



60.550.016

Also Available

Instruments

310.93K	Replacement Key for Small Chuck (05.001.252)
05.001.251	AO Screw Attachment
05.001.252	Small Chuck with Key
05.001.254	Chuck with Key, Reaming Speed
05.001.024	Adaptor for Small Battery Drive for Electric Pen Drive
510.19	Replacement Key for Large Chucks (05.001.253 and 05.001.254)
511.30	Radiolucent Drive
519.40	Cleaning Brush
519.97	Autoclavable Oil
532.023	Oscillating Saw Attachment II
532.018	Hudson Reduction Drive Unit
532.019	Trinkle Reduction Drive Unit
532.020	Modified Trinkle Reduction Drive Unit

05.001.252

511.30

Graphic Case

60.550.015	Insert Tray for Small Battery Drive Adaptor for Electric Pen Drive
60.550.017	Insert Tray for Two Small Battery Drive Handpieces
60.550.018	Label Sheet for Small Battery Drive Set Attachment Rack
690.525	Small Graphic Case for Small Battery Drive Set
690.576.04	Grommets for Attachment Rack for Small Battery Drive Graphic Case, 4 Pack

Service and Extended Warranty Programs

W1.105.955	One-Year Extended Warranty and Service Program, for Small Battery Drive Set
W3.105.955	Three-Year Extended Warranty and Service Program, for Small Battery Drive Set

Saw Blades for Oscillating Saw Attachment II (532.023)

All saw blades are sterile-packed.

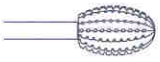
Crescent blades for halux valgus			Usable Length (mm)	Blade Width (mm)	Cut Thickness (mm)	Diameter (mm)
		03.000.311S	26.5	13.3	0.6	18.0
		03.000.312S	25.0	16.3	0.6	18.0
		03.000.313S	30.0	17.9	0.6	22.0
		03.000.316S	30.0	21.9	0.6	22.0

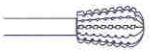
Saw blades, 105° angled for intra-oral			Usable Length (mm)	Blade Width (mm)	Cut Thickness (mm)	Shank Length (mm)
		03.000.343S	12.0	4.5	0.4	70.0
		03.000.342S	12.0	9.5	0.4	70.0
		03.000.341S	12.0	11.5	0.4	70.0
		03.000.340S	7.0	12.0	0.4	70.0

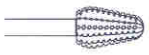
Burrs with mini quick and J-latch couplings

All burrs are sterile-packed. For Mini Quick Coupling attachment (523.011) or J-latch Coupling attachment (532.012)

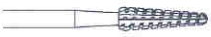
Round burrs		Diameter (mm)	Length (mm)	Coupling
	03.000.170S	3.0	28	mini quick
	03.000.171S	3.0	45	mini quick
	03.000.172S	5.0	45	mini quick
	03.000.200S	3.0	28	J-latch
	03.000.201S	3.0	45	J-latch
	03.000.202S	5.0	45	J-latch

Egg-shaped burrs		Diameter (mm)	Length (mm)	Coupling
	03.000.173S	7.0	28	mini quick
	03.000.174S	7.0	45	mini quick
	03.000.175S	8.0	28	mini quick
	03.000.176S	8.0	45	mini quick
	03.000.203S	7.0	28	J-latch
	03.000.204S	7.0	45	J-latch
	03.000.205S	8.0	28	J-latch
	03.000.206S	8.0	45	J-latch

Conical burrs		Diameter (mm)	Length (mm)	Coupling
	03.000.177S	5.0	23	mini quick
	03.000.178S	5.0	28	mini quick
	03.000.179S	5.0	45	mini quick
	03.000.180S	6.0	24	mini quick
	03.000.181S	6.0	28	mini quick
	03.000.182S	6.0	45	mini quick
	03.000.207S	5.0	23	J-latch
	03.000.208S	5.0	28	J-latch
	03.000.209S	5.0	45	J-latch
	03.000.210S	6.0	24	J-latch
	03.000.211S	6.0	28	J-latch
	03.000.212S	6.0	45	J-latch

Pear-shaped burrs		Diameter (mm)	Length (mm)	Coupling
	03.000.183S	5.0	23	mini quick
	03.000.184S	5.0	28	mini quick
	03.000.185S	5.0	45	mini quick
	03.000.186S	6.0	24	mini quick
	03.000.187S	6.0	28	mini quick
	03.000.188S	6.0	45	mini quick
	03.000.213S	5.0	23	J-latch
	03.000.214S	5.0	28	J-latch
	03.000.215S	5.0	45	J-latch
	03.000.216S	6.0	24	J-latch
	03.000.217S	6.0	28	J-latch
	03.000.218S	6.0	45	J-latch

Cutting Tools continued

Fissure burrs, tapered		Diameter (mm)	Length (mm)	Coupling
	03.000.189S	2.1	31	mini quick
	03.000.190S	2.1	45	mini quick
	03.000.191S	3.2	31	mini quick
	03.000.192S	3.2	45	mini quick
	03.000.219S	2.1	31	J-latch
	03.000.220S	2.1	45	J-latch
	03.000.221S	3.2	31	J-latch
	03.000.222S	3.2	45	J-latch

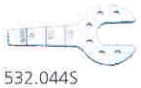
Circular burrs		Diameter (mm)	Length (mm)	Coupling
	03.000.193S	8.0	28	mini quick
	03.000.194S	10.0	28	mini quick
	03.000.195S	12.0	28	mini quick
	03.000.196S	15.0	28	mini quick
	03.000.223S	8.0	28	J-latch
	03.000.224S	10.0	28	J-latch
	03.000.225S	12.0	28	J-latch
	03.000.226S	15.0	28	J-latch

Lindemann reamers		Diameter (mm)	Length (mm)	Coupling
	03.000.197S	2.3	45	mini quick
	03.000.227S	2.3	45	J-latch

All saw blades are sterile-packed.

Saw blades, 0.4 mm cutting thickness

	Calibrated Length (mm)	Width (mm)
532.041S	10	6
532.042S	10	10
532.043S	10	16
532.044S	15	4
532.045S	20	8
532.046S	20	12
532.047S	30	6
532.048S	30	10



532.044S

532.048S

Saw blades, 0.6 mm cutting thickness

	Calibrated Length (mm)	Width (mm)
532.061S	25	6
532.062S	25	10
532.063S	25	14
532.064S	50	10
532.065S	50	14
532.066S	50	20
532.067S	50	27

532.067S

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